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PUBLICATIONS ON FOREST GENETICS, Southeastern Forest Experiment Station

compiled by

Keith W. Dorman

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U. S. DEPARTMENT OF AGRICULTURE

SOUTHEASTERN FOREST
EXPERIMENT STATION
Asheville, North Carolina

E. L. Demmon,
Director

U. S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE

FOREWORD

This list covers publications in the field of forest genetics and related subjects from 1939 through 1955. The short abstracts present important conclusions. The list is arranged by years, each year alphabetically by author.

It is hoped that lists such as this will enable those interested in the subject field to keep informed of new developments. The difficulty of reading all material about forest genetics is indicated by the large number of publication outlets. The attached list contains 90 articles which appeared in 34 different outlets.

PUBLICATIONS ON FOREST GENETICS,

Southeastern Forest Experiment Station

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Keith W. Dorman

MINCKLER, L. S.
1939. Genetics in forestry. Jour. Forestry 37: 559-564.

Considerable confusion exists regarding the application of genetics to forestry practice in America. It is emphasized that we should apply all that is known about genetics until research establishes further facts.

MINCKLER, L. S.
1942. One-parent heredity tests with loblolly pine. Jour. Forestry 40: 505-506.

One-hundred five lots of 1-0 loblolly seedlings grown from the seed of widely differing parent trees were planted in a randomized block experiment. Fifth year survival and growth measurements showed no significant relation with any observable characteristics of adult mother trees. The data did show significant differences in both growth and survival of progenies from different mother trees.

MITCHELL, H. L.
1942. The development of a high-yielding strain of naval stores pine. Naval Stores Rev. 52(7): 10, 12, illus. Also, with title Vegetative methods offer promising short cuts in propagating the high-yielding pine trees, AT-FA Jour. 4(7): 8-9, illus.

Announces establishment and objectives of the project to develop a high-yielding strain of pine for naval stores use and gives progress for the first 6 months of work. Reports successful rooting of cuttings from very young trees.

MITCHELL, H. L.
1942. Development of high-yielding strain of naval stores pine. South. Forest Expt. Sta., South. Forestry Notes No. 45.

Brief statement on objectives and accomplishments of the project after about 6 months of work. Reports successful rooting of cuttings from very young trees.

MITCHELL, H. L.
1942. Studies regarding the development of a high-yielding strain of naval stores pine. Forest Farmer 1(11): 1, 3.

Brief statement of objectives and progress. Abstract of paper presented before Southern Forestry Conference of 1942.

MITCHELL, H. L., SCHOPMEYER, C. S., and DORMAN, K. W.
1942. Recent developments in the selection and propagation of high-yielding naval stores pine. South. Forest Expt. Sta., South. Forestry Notes No. 46.

Summarizes the progress and accomplishments after about the first year of work. Superior trees producing from two to three times the yield of gum from average trees were located, and cuttings from mature slash pine trees were successfully rooted.

MITCHELL, H. L., SCHOPMEYER, C. S., and DORMAN, K. W.
1942. Pedigreed pine for naval stores production. Science 96: 559-560.

Describes work on the project and accomplishments in selection where trees producing from two to three times as much gum as average trees were located. Also reports on experiments in vegetative propagation and details of method used to root cuttings from mature trees.

CURRY, J. R.
1943. Selection, propagation, and breeding of high-yielding southern pine for naval stores production. Jour. Forestry 41: 686-687.

Efficiency in naval stores production has been decreasing and competition is stronger. Development of a high-yielding strain is advanced as a means of increasing tree yields and efficiency of labor. Work is progressing along three lines: (1) selection of superior trees, (2) vegetative propagation experiments, and (3) controlled breeding.

SNOW, A. G., Jr., DORMAN, K. W., and SCHOPMEYER, C. S.
1943. Breeding blueblood pines. AT-FA Jour. 5(6): 8-10, illus.

Flowering characteristics of slash pine and the importance of using good breeding stock in the development of superior pine trees are given.

SNOW, A. G., Jr., DORMAN, K. W., and SCHOPMEYER, C. S.
1943. Developmental stages of female strobili in slash pine. Jour. Forestry 41: 922-923, illus.

Early growth and development of the female flower is divided into four stages: (1) suitable for placing pollination bags; (2) latest stage for bagging; (3) optimum for pollinating; (4) beyond receptive stage, and bags may be removed.

DORMAN, K. W., SCHOPMEYER, C. S., and SNOW, A. G., Jr.
1944. Top bracing and guying in the breeding of southern pines. Jour. Forestry 42: 140-141, illus.

Breeding or other work in the tops of slash and longleaf pine can be made safer and easier by reinforcing the upper part of the central stem with 2x2-inch splints and by the use of three guy wires from the top of the tree to the ground.

DORMAN, K. W.
1945. High-yielding turpentine orchards--a future possibility. The Chemurgic Digest 4: 293, 295-299, illus.

Development of a high-producing strain is offered as a solution to many of the problems of the naval stores industry. Superior trees have been located, methods have been developed for vegetative propagation of slash pine, and controlled breeding with superior trees has been carried out. It is estimated that yields can be increased from the present average of 166 pounds per acre to 3,500 pounds by the use of superior trees grown in well-managed, fully-stocked stands.

MINCKLER, L. S.
1945. Seed source. Is it taken seriously? Jour. Forestry 43: 749-750.

Data collected on shortleaf and loblolly seed source for forest nurseries of 12 states show a lack of progress in obtaining a satisfactory seed source. Absence of a sound policy is attributed to lack of conviction that source is of real importance and to the conflict between technical considerations and administrative efficiency.

DORMAN, K. W.
1946. The life history of slash pine. National Container Digest 2(10): 1, 4, 5, illus.

Development of female flowers, seeds and slash pine trees for one life cycle is discussed.

DORMAN, K. W.
1947. Pedigreed pines for Dixie's future forests. Forest Farmer 6(8): 7.

An outline of work already begun for producing a better pine for southern forests. This includes selection of superior breeding stock, vegetative propagation to preserve the valuable traits of the stock, controlled breeding and further selection to combine the desirable characteristics of two or more trees into one tree or to increase some desirable characteristic, and the checking of performance of the progeny.

DORMAN, K. W.

1947. Rooted pine cuttings make rapid growth. AT-FA Jour. 9(11): 8, illus.

Slash pine cuttings rooted in the greenhouse and then planted in the field grow rapidly. Within 3 or 4 years from the parent tree they grow to be trees 6 feet or more in height.

DORMAN, K. W.

1947. Longleaf pine cuttings rooted in greenhouse. Jour. Forestry 45: 594.

Longleaf pine cuttings from large trees were rooted for the first time. The most effective treatment consisted of soaking the bases of the cuttings for 24 hours in a water solution containing 15 p.p.m. traumatic acid, 15 p.p.m. sodium pentachlorophenate, 10 p.p.m. vitamin B_1, 5 percent sucrose, and 0.4 percent of a commercial plant food.

DORMAN, K. W.

1947. Progress in breeding better turpentine pines. AT-FA Jour. 9(12): 10, 15, illus.

The controlled-breeding work of 1943 and 1944 with slash pine resulted in enough seed to produce 600 seedlings. These were set out in a plantation in 1946. Each of these seedlings has a carefully recorded pedigree. The plantation includes crosses of high-yielding turpentine pines, average-yielding trees, and some slash-loblolly and slash-longleaf hybrids. When the seedlings are large enough, the gum-yielding capacity of the different groups will be compared by small-scale chipping methods.

DORMAN, K. W.

1947. Better pines for turpentining. American Forests 53: 498-500, illus.

In the rubber industry production efficiency was greatly increased by the use of superior trees obtained by controlled breeding. On the other hand, the pine gum industry in America is suffering from decreasing efficiency. This article is a popular account of selection and breeding work, similar to that done with the rubber tree, designed to increase the efficiency of the gum industry by developing a strain of high-yielding trees which will greatly increase yields per acre with little additional labor.

DORMAN, K. W.

1947. Breeding better southern pines for the future. South. Lumberman 175(2201): 147-150, illus.

A popular account of the work in tree selection, breeding and vegetative propagation of southern pines. In a concluding section the author speculates on the gum yields possible from a plantation of cuttings from known superior trees. The greater gum yield of these trees and better stocking of the plantation could yield 24 times as much gum per acre as the present average acre of turpentine timber.

DOWNS, Albert A.
1948. How pine cuttings are rooted. Forest Farmer 7(5): 26, illus.

Important factors in rooting cuttings of slash and longleaf pine are treatment with a growth regulator, such as traumatic acid, and a carefully controlled environment. Cuttings must be sprayed intermittently with water during the daylight hours to prevent desiccation.

HEPTING, George H., and TOOLE, E. Richard
1948. Wilt epidemiology and resistance in the mimosa tree. (Abs.) Phytopath. 38: 13.

The wilt has spread from Maryland to Florida in the 12 years since it was discovered in North Carolina. Occasional seedlings have resisted the wilt following several severe inoculations. Twenty-eight resistant clones are now available. Cuttings from these are also highly resistant.

TOOLE, E. Richard
1948. Rootability of cuttings. American Nurseryman 88(2): 72.

Rooting tests with the mimosa tree showed that in the case of stem cuttings the nearer the root system the cuttings were taken the better they rooted, indicating increased content of rooting hormone as one progresses from branch tip to branch-to-stem and down the stem.

CLAPPER, Russell B., and MILLER, John M.
1949. Breeding and selecting pest-resistant trees, USDA Yearbook, Trees: 465-471. Washington, D. C.

A general discussion of attempts to breed for resistance to tree diseases and insects in the United States.

DOWNS, Albert A.
1949. Unusual tree appears in breeding tests. Forest Farmer 9(2): 8, illus.

During a dry period the needles of one tree in a slash pine gum-yield progeny test develop alternating rings of bright yellow and dull green. From a distance, this 4-year-old tree appears bright yellow. In drought periods the surrounding trees turn a uniform dull yellowish green. The unusual tree appears in no danger of dying. When a drought ends, the tree gradually regains a healthy green color.

DOWNS, Albert A.
1949. Developing better pines for gum production. South. Lumberman 179(2249): 233-236, illus.

Accomplishments of 8 years' work by the Lake City Branch of the Southeastern Forest Experiment Station toward the development of a high-yielding strain of naval stores pine are reported. A dozen trees have been found which produce at least twice as much gum as the average of the trees around them. Breeding work with these trees and with trees of average and low yield capacity has been designed with the aim of creating superior trees and supplying information on the manner in which the high-yielding characteristic is inherited. One progeny test plantation of 600 trees is now 4 years old, and 800 one-year-old seedlings are available to establish another progeny test plantation. Methods of rooting pine cuttings have been developed. For trees of working size, 5 to 20 percent of the cuttings root. Cuttings from very young trees root more easily.

DOWNS, Albert A.
1949. Low forking in white oak sprouts may be hereditary. Jour. Forestry 47: 736.

In 30 clumps of sprouts in a 25-year-old stand in the Piedmont of Virginia in which the largest stem was forked, 53 percent of the next largest stems were also forked. In 102 clumps in which the largest stem was straight, all but 4 percent of the next largest stems were also straight. A chi-square test of the ratios showed that this difference was significant. Only stems definitely forked below 24 feet were classed as forked; all others were classed as straight or not forked.

JACKSON, L. W. R., and ZAK, Bratislav
1949. Grafting methods used in studies of the littleleaf disease of shortleaf pine. Jour. Forestry 47: 904-908, illus.

In transmission experiments with littleleaf disease both the aboveground parts and the roots of shortleaf pines were successfully grafted with seedlings, saplings, and adult trees serving as stock trees. The bark-patch method proved highly successful. The approach grafting method although not quite as successful as the first method, did, nevertheless, give a fair percentage of graft unions for both stems and roots. Thus far, healthy trees receiving the grafts have not developed symptoms of the disease.

TOOLE, E. Richard
1949. Selection and propagation of wilt-resistant mimosa trees. Trees 9(4): 10, 12, 16, illus.

Describes the wilt resistance found in the mimosa tree as mentioned in earlier articles, and also gives directions for rooting cuttings of root pieces for propagation of resistant clones.

TOOLE, E. Richard, and HEPTING, George H.
1949. Selection and propagation of Albizzia for resistance to Fusarium wilt. Phytopath. 39: 63-70, illus.

In testing certain species of Albizzia, mainly _A. julibrissin_, for resistance to Fusarium wilt, 1437 seedlings have been grown from seed collected at various locations from Maryland to Louisiana, and their roots inoculated. Twenty of these trees have survived the disease as long as 8 years, despite repeated inoculations, and in the more recent experiments many more have survived for shorter periods. Fifty-six percent of the seedlings grown from seed resulting from uncontrolled pollination of the resistant selections were wilt-resistant.

All cuttings rooted from the resistant selections have thus far appeared immune to the wilt despite successive inoculations, while rooted cuttings from neighboring nonresistant wildlings became diseased and died following inoculation.

CLAPPER, Russell B.
1950. Breeding new chestnuts for southern forests. Forest Farmer 9(11): 8, illus.

Gives a brief history of the chestnut blight, the search for resistance among Oriental chestnuts, descriptions of some of the better Oriental types, and also mentions the breeding and hybridizing program of the USDA and some of the promising results. Discusses the problems of mass-producing resistant chestnuts.

DORMAN, K. W.
1950. The genetics of southern pines (a preliminary report). Southeast. Forest Expt. Sta., 52 pp., illus.

A discussion of phytogeny of gymnosperms, classification of pines, mechanism of pollination, development of the seed, controlled-breeding methods, and variation in wild stands.

DORMAN, K. W.
1951. We need better seed collecting equipment. U. S. Forest Service, Tree Planters' Notes 5: 2.

A brief discussion of the need for improved equipment for tree climbing and cone picking.

CLAPPER, Russell B.
1952. Relative blight resistance of some chestnut species and hybrids. Jour. Forestry 50: 453-455, illus.

Summarizes 25 years of selecting and breeding, including hybridization, among American chestnuts and chinquapins, and blight-resistant Oriental chestnuts. Describes some promising progeny from this work.

CLAPPER, R. B.
1952. Breeding and establishing new trees resistant to disease. Econ. Bot. 6: 271-293.

A review of the USDA program of selecting, breeding, and testing chestnuts resistant to blight among a wide range of species of Castanea.

COMMITTEE on Southern Forest Tree Improvement (C. E. Ostrom, Chairman)
1952. Suggested projects in the genetic improvement of southern forest trees, Southeast. Forest Expt. Sta. Paper 20, 12 pp.

Projects are listed in: (1) application of genetics to the collection of seed for planting, (2) geographic source of seed for forest planting, (3) improvement of southern forest trees through selection and breeding, (4) techniques and basic aspects of forest genetics such as selection, anatomical studies, breeding, methods for control of flowering and fruiting, methods of vegetative propagation, and equipment for tree improvement work.

DORMAN, K. W.
1952. Hereditary variation as the basis for selecting superior forest trees. Southeast. Forest Expt. Sta. Paper 15, 88 pp., illus.

A comprehensive discussion of the basis for heritable variation and selection in tree improvement and silviculture.

DORMAN, K. W.
1952. Directory of forest genetics activities in the south. Southeast. Forest Expt. Sta. Paper 17, 17 pp.

Lists by administrative agency work now under way in tree introduction, racial variation, selection and hybridization, vegetative propagation, cytology, and stimulation of seed production.

HEPTING, George H., TOOLE, E. Richard, and BOYCE, John S., Jr.
1952. Sex and compatibility in the oak wilt fungus. Plant Dis. Rptr. 36: 64.

The oak wilt fungus is described as hermaphroditic, self-sterile, interfertile, and of two compatibility types. A fungus thallus of either compatibility type can function as a male or female, but will mate only with the opposite compatibility type.

HEPTING, George H., TOOLE, E. Richard, and BOYCE, John S., Jr.
1952. Sexuality in the oak wilt fungus. Phytopath. 42: 438-442, illus.

The experimental data on 28 isolates of the oak wilt fungus that prove the preceding article on sex and compatibility are presented. Ways are described by which the two compatibility-type constitution of the fungus can be used to forward oak wilt research. A single tree usually has only one type (A or B), but occasionally a tree has both types in its vascular system. The types can be identified by the success or failure of spermatization with tester cultures of known type.

LITTLE, Elbert L., Jr., and DORMAN, K. W.
1952. Geographic differences in cone opening in sand pine. Jour. Forestry 50: 204-205.

The suggestion is made that typical sand pine with closed cones be called _Ocala sand pine_ or _Ocala race_, whereas that occurring in western Florida with open cones be called _Choctawhatchee sand pine_ or _Choctawhatchee race_.

LITTLE, E. L., Jr., and DORMAN, K. W.
1952. Slash pine (_Pinus elliottii_), its nomenclature and varieties. Jour. Forestry 50: 918-923, illus.

A discussion of the nomenclature of slash pine with the recommendation that the pine in the United States be separated from the Caribbean pine and that a new variety, South Florida slash pine, be recognized.

TOOLE, E. R.
1952. Two races of *Fusarium oxysporum* f. *perniciosum* causing wilt of *Albizzia* spp. Phytopath. 42: 694

Describes two forms of mimosa wilt fungus, one attacking *A. julibrissin* and one attacking *A. procera* (Puerto Rico).

BARBER, J. C.
1953. Tree planting at the Bent Creek Experimental Forest. Southeast. Forest Expt. Sta. Paper 27, 11 pp., illus.

A report on the survival and growth of experimental plantings, including the arboretum established in 1926.

DOOLITTLE, Warren T.
1953. Growth and survival of hybrid poplars. South. Lumberman 187(2345): 178-179, illus.

Growth of 12 clones planted in 1935 indicates that certain hybrid poplars on good sites in the Southern Appalachians grow faster than the most rapid-growing native species such as white pine, yellow-poplar, or northern red oaks.

DORMAN, K. W.
1953. A taxonomic study of slash pine. (Abs.) Assoc. South. Agr. Workers Proc. 50: 116-117.

Slash pine, one of the most valuable southern pines, is a distinct species from Caribbean pine, with which it has usually been united. The related pine of southern Florida is now recognized as a botanical variety.

DORMAN, K. W., BAUER, E., and GREENE, J. T.
1953. Tree improvement makes a step ahead. South. Lumberman 187(2345): 170-171, illus.

A description of the history and progress of the tree improvement program at the Ida Cason Callaway Foundation, Hamilton, Georgia. Reports variation in vigor of open-pollinated progeny of slash and loblolly pine maternal parents.

MERGEN, F.
1953. Gum yield in longleaf pine inherited. Naval Stores Rev. 62(47): 18-19, illus. Also, with title Gum yields in longleaf pine are inherited, Southeast. Forest Expt. Sta. Research Note 29, 2 pp., illus. Also in AT-FA Jour. 15(5): 14-17, illus.

First evidence that gum-yielding capacity is inherited is obtained from 17-year-old progeny test.

MERGEN, F.
1953. The story of some unique trees. South. Lumberman 186(2329): 72, 74.

For the first time in history, mature cones were collected from rooted slash pine cuttings. In addition to being a historical " first" it represents one step closer to the goal of developing high-yielding pines for naval stores.

MERGEN, F.

1953. Selection and breeding of slash and longleaf pine at Lake City, Florida (in English). Zeitschrift fur Forstgenetik und Forstpflanzenzuchtung 2(6): 126-129, illus. Frankfurt, Germany. Also in Internatl. Union Forest Res. Organ. Cong. (Proc.) 11: 481-487. Pub. 1954. Also, with title Selection and breeding of longleaf pine, in Naval Stores Rev. 63(7): 12-14, 23-26, illus.

Research in species improvement of longleaf and slash pine at the Lake City Research Center includes tree selection, vegetative propagation, and controlled breeding. Preliminary results are discussed.

MERGEN, F.

1953. First mature cones collected from rooted slash pine cuttings. AT-FA Jour. 15(10): 8-9.

Beginning with the rooting of cuttings in 1943-44, this is the first recorded production of mature cones from rooted slash pine.

MERGEN, F.

1953. Air-layering as a possible method to reproduce selected slash pine. Naval Stores Rev. 63(21): 19, 20, illus.

Long known to horticulturists as a method of reproducing cultivated plants, air-layering has been used successfully for the first time on slash pine.

MERGEN, F., and POMEROY, K. B.

1953. Some practical suggestions for better slash pine seed. The South. Lumber Jour. 57(11): 88-89, illus.

Organizations with extensive reforestation programs might improve seed quality in slash pine by improving selected natural stands of vigorous, even-aged, cone-bearing trees. Method of improvement and hints for seed collection are discussed.

OSTROM, C. E.

1953. More and better trees: the activities of the Committee on Southern Forest Tree Improvement. South. Lumberman 186(2326): 35-36. Also, with title Accomplishments of the Committee on Southern Forest Tree Improvement, in Naval Stores Rev. 62(51): 14-15, 26-28, illus. Also, with title Recent developments in the southern forest tree improvement program, (Abs.) Assoc. South. Agr. Workers Proc. 50: 115-116.

Discussion of the function, accomplishments, and plans of the Committee on Southern Forest Tree Improvement.

POMEROY, K. B.
1953. Tree improvement--its potentialities. Forest Farmer 12(11): 8, 9, 11, illus. Also in The Unit 48: 25-27, illus. Also in Paper Trade Jour. 137(6): 18-19, illus.

Preliminary results show that the value of forest trees can be increased by genetic control of inherited characteristics. Best returns in forest tree improvement will probably be achieved by combined efforts of silviculturists working with environmental factors and geneticists working with inherited factors.

POMEROY, K. B.
1953. Research in tree improvement at Lake City, TAPPI 36(11): 147a-150a.

Forest managers who remove undesirable trees, leave only the best trees for regeneration, and plant seedlings from the best available local parentage can reap the benefits of eugenic forestry while waiting for the deferred benefits of controlled breeding.

POMEROY, K. B.
1953. Better trees for tomorrow. Naval Stores Rev. 63(20): 19, 21-22. Also in AT-FA Jour. 16(2): 18.

Propagation and controlled breeding, proven tools of the horticulturist and agronomist, are now being used in developing superior strains of longleaf and slash pine.

SCHOPMEYER, C. S.
1953. The characteristics of a high gum-yielding tree. Naval Stores Rev. 63(12): 12-13, illus. Also in AT-FA Jour. 15(10): 4, illus. Also in Southeast. Forest Expt. Sta. Research Note 39, illus.

The factors controlling gum flow in slash pine appear to be size of resin ducts exposed by chipping, number of ducts per square inch of fresh face, viscosity of gum, and exudation pressure. If these factors are inheritable, trees rating high on all four can be developed by controlled breeding.

WENGER, K. F.
1953. The effect of fertilization and injury on the cone and seed production of loblolly pine seed trees. Jour. Forestry 51: 570-573, illus.

Application of fertilizer at the rate of 25 and 50 pounds per tree significantly increased cone production of 25-year-old loblolly pines. Forty-year-old trees did not respond to treatment. Half-girdling with a knife produced no increase in cone crop. Treatments did not significantly affect percentage of defective cones, number of seeds per cone, or percentage of defective seed per cone.

ZAK, B.

1953. Developing littleleaf-resistant shortleaf pine. South. Lumberman 187(2345): 147-149, illus.

Healthy and vigorous individual trees have been found surrounded by dead and dying trees. Potted seedlings show variable susceptibility to fungus attack when inoculated. Open-pollinated seed has been collected from apparently healthy trees. Also, these trees have been cross pollinated. Seed from more than a dozen localities over the range of shortleaf pine has been planted on severe littleleaf areas in Virginia, South Carolina, and Georgia in a test of racial variation in disease resistance. A number of selected trees have been propagated by grafting. A method of testing potted seedlings against Phytophthora cinnamomi within 2 years has been developed; also, a shorter method using seedlings growing in liquid solutions.

HEPTING, G. H.

1954. Gum flow and pitch soak in Virginia pine following Fusarium inoculation. Southeast. Forest Expt. Sta. Paper 40, 9 pp., illus.

Describes gum yields and amount of pitch-soaking in Virginia pine following inoculations with the pitch canker fungus.

HOEKSTRA, P. E.

1954. New blood for southern pines. South. Lumberman 189(2369): 182-183, illus.

Nonindigenous species and varieties of pine are being established in Florida to furnish material for tree improvement.

LITTLE, E. L., Jr., and DORMAN, K. W.

1954. Slash pine (Pinus elliottii) including South Florida slash pine, nomenclature and description. Southeast. Forest Expt. Sta. Paper 36, 82 pp., illus.

A report on the botanical basis for a recent change in scientific nomenclature.

McGREGOR, W. H. D., COWAN, D. R., and SPURR, S. H.

1954. Three races of scotch pine compared in southeastern Michigan. U. of Mich., Dept. Forestry, Michigan Forestry No. 5, 2 pp.

The trees from northern Europe grow more slowly but have better form than those from central Europe.

MERGEN, F.

1954. Grafting succulent slash pine scions. Southeast. Forest Expt. Sta. Research Note 59.

The discovery that scions can be grafted in the succulent stage promises to prolong the grafting season by several months.

MERGEN, F.
1954. Variation in 2-year-old slash pine (P. elliottii var. elliottii) seedlings. Southeast. Forest Expt. Sta. Research Note 62.

Survival of seedlings from all five geographic seed sources in Florida was high, but the growth of one from Polk County was low.

MERGEN, F.
1954. Self-fertilization in slash pine reduces height growth. Southeast. Forest Expt. Sta. Research Note 67.

Self-pollination tends toward poor seed set, low germination, reduced vigor, deformed growth, retarded flowering, or some degree of albinism.

MERGEN, F.
1954. Heteroplastic micrografting of slash pine. Southeast. Forest Expt. Sta. Paper 47, 17 pp., illus.

A project in grafting 1- to 6-month-old slash pine seedlings onto other coniferous species such as white spruce, white pine, ponderosa pine, and others.

MERGEN, F.
1954. Improving the early growth of longleaf pine. Naval Stores Rev. 64(3): 12, 13, 21. Also in Forest Farmer 13(11): 8, 9, 16, 17, illus.

Some 261 slash-longleaf pine hybrids have been produced for possible use in reforestation of dry sites.

MERGEN, F.
1954. Vegetative propagation techniques for genetics studies of slash pine (Pinus elliottii, Engelm.). American Soc. Plant Physiol. Program for the 29th Annual Meeting, pp. 6-7.

Review of techniques covered in more detail in other publications.

MERGEN, F.
1954. Mechanical aspects of wind-breakage and wind-firmness. Jour. Forestry 52: 119-125, illus.

Crown thinning and early improvement cuttings increase the exposure of young stands to wind pressure; in response the trees become more wind-firm and less susceptible to storm damage.

MERGEN, F.
1954. Inheritance of oleoresin yield in slash pine. AT-FA Jour. 17(2): 16-18, illus. Also in Naval Stores Rev. 64(9): 8, 9, 20, illus.

A test of the progeny from parent trees selected for high-gum production showed that gum-yielding ability is inherited.

MERGEN, F.
1954. Anatomical study of slash pine graft unions. Quart. Jour. Florida Acad. Sci. 17: 237-245, illus.

An anatomical study of the sequence of the knitting of a union in young slash pines showed that parenchymatous cells of medullary rays, phloem, cortex, and cambium participated in bridging the space between stock and scion tissues. The stock contributed the greatest part of the wound tissue, but the scion took part in callus formation. A continuous bridge between respective anatomical parts of the graft partners was apparent after 6 weeks.

MERGEN, F., and HOEKSTRA, P. E.
1954. Germination differences in slash pine from various sources. South. Lumberman 189(2364): 62, 64, 66.

Real differences are indicated in seed characteristics from collections in different locations.

MERGEN, F., and POMEROY, K. B.
1954. Tree improvement research at the Lake City, Florida, research center, a project analysis. Southeast. Forest Expt. Sta. Paper 45, 59 pp., illus.

Superior attributes sought are rapid growth, disease resistance, better stem form, and improved grain or density of wood.

MERGEN, F., and POMEROY, K. B.
1954. Suggestions for better slash pine seed. Forest Farmer 13(5): 6-7, 15, illus.

Directions for selection and reservation of trees capable of producing superior seeds in quantity.

MERGEN, F., and ROSSOLL, H.
1954. How to root and graft slash pine. Southeast. Forest Expt. Sta. Paper 46, 22 pp., illus.

A graphic exposition of new techniques for asexual propagation of pines useful as breeding stock (45 drawings).

POMEROY, K. B.
1954. Better trees for tomorrow. Florida Grower and Rancher 17(2): 12, 34.

General review of the possibilities of improvement of southern pine trees through genetic research.

POMEROY, K. B.
1954. Looking ahead with naval stores. Forest Farmer 13(12): 14, 18.

Discussion of future trends in the naval stores industry, describing the part to be played by high-yielding strains of pine.

SCHOPMEYER, C. S., MERGEN, F., and EVANS, T. C.
1954. Applicability of Poiseuille's Law to exudation of oleoresin from wounds on slash pine. Plant Physiol. 29: 82-87, illus.

The variables in a modification of the equation for Poiseuille's Law for the flow of liquids through capillaries were measured in the resin duct system of 12 slash pine trees (Pinus elliottii Engelm. var. elliottii). The modified equation is given.

ZOBEL, B., DORMAN, K. W., PERRY, T., GARIN, G., and WEISEHUEGEL, E. G.
1954. The role of genetics in southern forest management. Forest Farmer 14(1): 4-6, 14-15, illus., 14(2): 8, 9, 14-19, illus., 14(3): 8, 9, 14-15, illus.

I. Environment is the most important factor in tree development only within definite genetic limits.

II. Seed collection for forest nurseries must be from the most favorable geographic origin.

III. In reserving seed trees, select superior individuals insofar as possible.

BARBER, J. C., DORMAN, K. W., and JORDAN, R. A.
1955. Slash pine crown width differences appear at early age in 1-parent progeny tests. Southeast. Forest Expt. Sta. Research Note 86.

Crown-width of 3-year-old trees in 1-parent progeny tests shows strong correlation with crown width of mother tree. This holds true for both wide-crown and narrow-crown trees.

BISHOP, G. N., and NELSON, T. C.
1955. A winter key to the hickories of Georgia. Southeast. Forest Expt. Sta. Research Note 89.

Includes 9 species with names corresponding to the latest check list.

DORMAN, K. W.
1955. Short-time and long-time possibilities of selection in forest trees. Proc. Third South. Conf. on Forest Tree Improvement, pp. 31-35. New Orleans

Selection of improved tree types should be based on results of studies of inherent variation within each species. Many economically important plant varieties have been obtained by selection, but the process does not create new types--it merely isolates those occurring naturally.

DORMAN, K. W.
1955. Progress in tree improvement research at the Southeastern Forest Experiment Station. Proc. Lake States Forest Tree Improvement Conference, pp. 28-33. Lake States Forest Expt. Sta. Misc. Report No. 40. 108 pp.

DORMAN, K. W.
1955. Vegetative propagation problems in the South. Proc. Lake States Forest Tree Improvement Conference, pp. 56-57. Lake States Forest Expt. Sta. Misc. Report No. 40, 108 pp.

ECHOLS, R. M., and MERGEN, F.
1955. How to extract large wood samples from living trees. Jour. Forestry 53(2): 136.

Successful method was to bore two holes to pith, insert flat-sided plugs as saw guides, saw between holes, and then chisel out the sample.

HARGREAVES, L. A., Jr., and DORMAN, K.W.
1955. Georgia starts pine seed orchards. South. Lumberman 191 (2393): 189. Dec. 15.

Scions of superior phenotypes in loblolly and slash pine will be grafted on run-of-the-mill seedlings in establishing 500 acres of seed orchards.

HEPTING, G. H.
1955. Littleleaf. The Unit 58: 74-75.

Status of littleleaf and research on control through genetics and soil management. Forest management in littleleaf areas is discussed.

LOTTI, T.
1955. Yellow-poplar height growth affected by seed source. Tree Planters' Notes 22: 3.

At the end of the third growing season the mountain strain averaged 4.4 feet in height and that from the Coastal Plain 7.9 feet.

MERGEN, F.
1955. Air-layering of slash pines. Jour. Forestry 53(4): 265-270.

The feasibility of air-layering as a technique in asexual propagation of slash pine is demonstrated.

MERGEN, F.
1955. Anatomical study of slash pine graft unions. Quart. Jour. Fla. Acad. Sci. 17(4): 237-245.

The pith and phloem were active in forming a union of stock and scion which was usually complete in about 6 weeks.

MERGEN, F.
1955. Grafting slash pine in the field and in the greenhouse. Jour. Forestry 53(11): 836-842.

Summarizes experiments with cleft, veneer or side-slit, and bottle grafts in the greenhouse and field.

MERGEN, F.
1955. Inheritance of deformities in slash pine. South. Lumberman 190(2370): 30-32. Jan. 1.

Progeny after open pollination of a crooked slash pine were 76 percent crooked; those of the same tree crossed with a straight tree were 68 percent crooked; those of the straight tree used as a female parent tree in other crosses were 41 percent crooked.

MERGEN, F.
1955. Rooting and grafting of slash pine. Proc. Third South. Conf. on Forest Tree Improvement, pp. 88-94. New Orleans.

Describes successful techniques for rooting, grafting, and air-layering.

MERGEN, F.
1955. Vegetative propagation of slash pine. Southeast. Forest Expt. Sta. Paper 54, 63 pp.

Presents details of many experiments in asexual propagation of the species.

MERGEN, F., HOEKSTRA, P. E., and ECHOLS, R. M.
1955. Genetic control of oleoresin yield and viscosity in slash pine. Forest Science 1(1): 19-30.

Gum yield and viscosity were highly controlled genetically, while number and size of resin ducts were not.

MERGEN, F., ROSSOLL, H., and POMEROY, K. B.
1955. How to control the pollination of slash and longleaf pine. Southeast. Forest Expt. Sta. Paper 58, 14 pp.

Latest techniques are presented in true-to-life drawings.

OSTROM, C. E.
1955. The tree improvement research program of the Southeastern Forest Experiment Station. Proc. Third South. Conf. on Forest Tree Improvement, pp. 101-104. New Orleans.

Studies in variation and inheritance, project work in selective breeding, and many facilitating studies are being conducted concurrently at several Research Centers.

POMEROY, K. B.
1955. Selecting slash pine for greater yields of turpentine. Proc. Third South. Conf. on Forest Tree Improvement, pp. 47-49. New Orleans.

Gives evidence that gum-yielding ability is strongly inherited in slash pine and that it is possible to select and breed genetically superior trees.

POMEROY, K. B.

1955. Up-grading slash pine seed sources. Proc. Soc. Amer. Foresters (1954) pp. 74-75. Also, with title How we get good pine seed, Progressive Farmer 70(10): 34D.

Recommends selection of genetically superior trees and establishment of clonal seed orchards.

POMEROY, K. B., and MERGEN, F.

1955. Better slash pine seed. Forest Farmer 14(6): 11. Also, with title Better forests a reality, National Container Digest 8(4): 5, 1954.

An 86-acre seed producing area was created by removing undesirable phenotypes from a 20-year-old slash pine plantation.

ZAK, B.

1955. The grafting of shortleaf and other pine species. Southeast. Forest Expt. Sta. Paper 59, 13 pp.

Describes the use of cleft, bottle, side, veneer, and "soft tissue" grafts, both indoors and out. Factors affecting the success of grafting are discussed. Soft tissue grafts were especially successful, both intraspecific and interspecific, and are recommended wherever feasible.

ZAK, B.

1955. Inheritance of resistance to littleleaf in shortleaf pines. Southeast. Forest Expt. Sta. Research Note 88.

In growth and resistance to Phytophthora root rot, open-pollinated progeny from littleleaf trees were inferior to open-pollinated progeny from associated healthy trees.

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